

Application

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Identification of Tobacco Varieties, Using Solid Phase Microextraction/Capillary GC

Sampling the headspace over a tobacco sample by solid phase microextraction (SPME) affords a fast, sensitive means of identifying the variety, through comparison of individual analytes.

Key Words:

• tobacco volatiles • solid phase microextraction • SPME

Several methods have been used for headspace analyses of tobacco varieties. Investigators at the Liggett Group have found that solid phase microextraction• offers several advantages over other methods, including simplicity of technique and equipment, less carryover of impurities (a potential problem with purge and trap methods, unless long trap bake times are used), sensitivity (less sample is required, relative to purge and trap methods), and shorter analysis times (literature reports suggest 20 minute purge and trap times are possible, but a minimum of 2 hours purge time at 95°C is required to provide data comparable to SPME by the method described here). SPME, using a fiber with a 100µm polydimethylsiloxane coating, is more selective for sampling nonpolar components than is purge and trap using a Tenax® material (MS spectra are less complex and the analysis is much more simple).

Tobacco samples were cut and adjusted to 12% moisture. A 1.00g subsample and 3.0mL of 3M KCl were sealed in a 20mL headspace vial and were heated to 95°C in a block heater during headspace SPME. Results are shown in Figure A. All identifications were made by the investigators based on mass spectral data, retention times and, for major components, SPME/GC/FTIR. The KCl solution and the 95°C temperature enhance the volatility of the minor components and thus improve detection.

Conditions for Figure A

Sample: 1.00g tobacco (12% moisture) + 3.0mL 3M KCl in 20mL headspace vial
SPME Fiber: **100µm polydimethylsiloxane**
Cat. No.: **57300-U** (manual sampling)
Extraction: headspace, 95°C, 30 min
Desorption: 1 min, 250°C
Column: 5% phenylmethylsiloxane, 30m x 0.25mm ID, 0.25µm film
Oven: 40°C (1 min) to 250°C at 6.0°C/min, hold 2 min
Carrier: helium, 30cm/sec
Det.: MSD, 280°C transfer line
Inj.: splitless, 250°C (0.75mm ID injector liner)

• Solid phase microextraction technology is licensed exclusively to Supelco (US patent pending; European patent #0523092).

Acknowledgment

This investigation was conducted by T. Jeffrey Clark and John E. Bunch, Liggett Group Inc., 710 West Main Street, Durham, NC 27702 USA.

Figure A. Tobacco Varieties Identified, Using SPME to Monitor Components

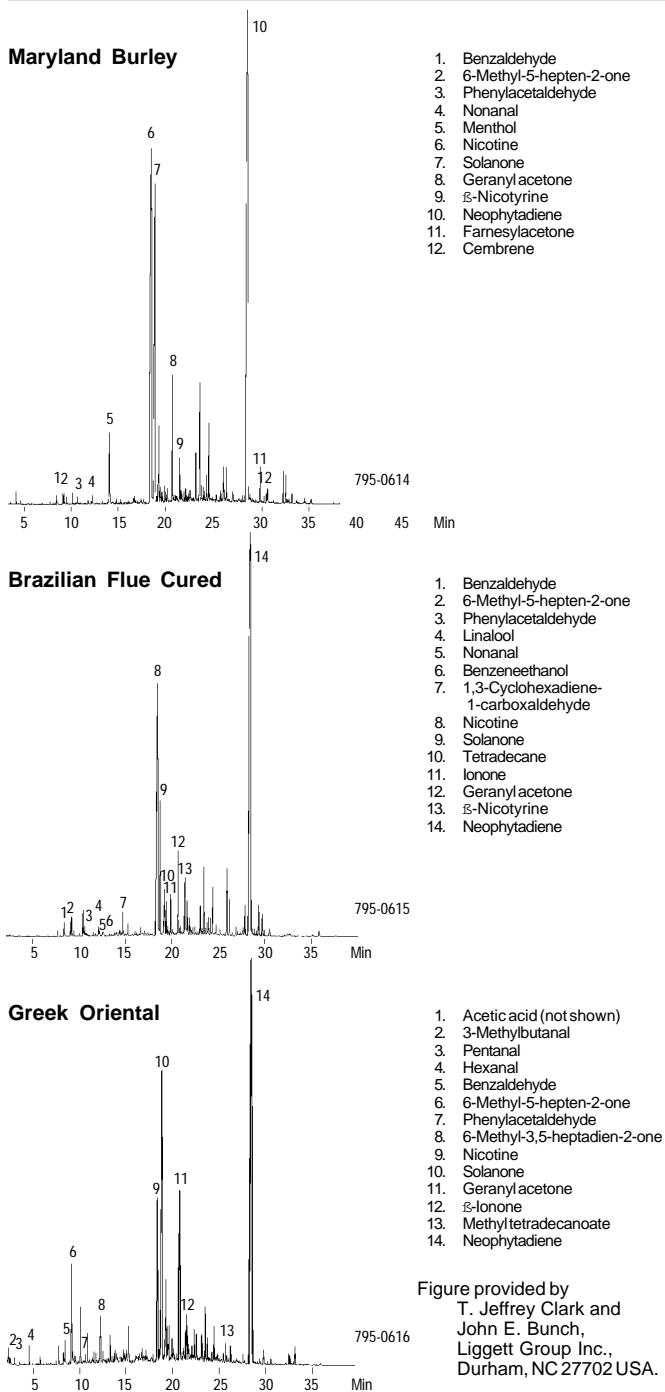
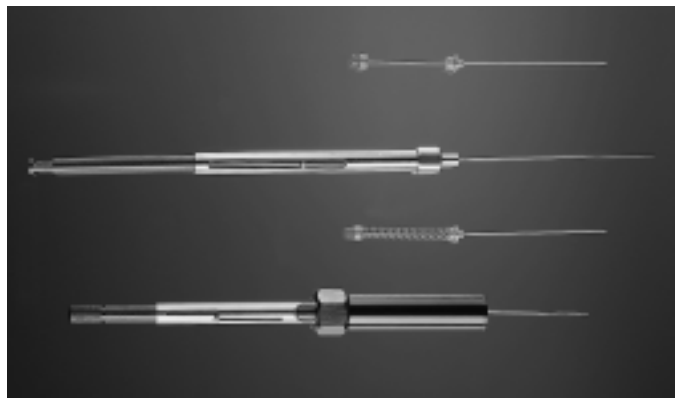


Figure provided by
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SPME Fiber Assemblies



995-0125

Ordering Information:

Description	Cat. No.
SPB™-5 Capillary Column 30m x 0.25mm ID, 0.25µm film	24034
SPME Fiber Holder* For manual sampling For Varian 8100/8200 AutoSampler (requires Varian SPME upgrade kit)	57330-U 57331
SPME Fiber Assembly (pkg. of 3) 7µm polydimethylsiloxane coating For manual sampling For Varian 8100/8200 AutoSampler	57302 57303
100µm polydimethylsiloxane coating For manual sampling For Varian 8100/8200 AutoSampler	57300-U 57301
30µm polydimethylsiloxane coating For manual sampling For Varian 8100/8200 AutoSampler	57308 57309
85µm polyacrylate coating For manual sampling For Varian 8100/8200 AutoSampler	57304 57305
SPME Fiber Assortment Kit One fiber each of 85µm polyacrylate coating and 100µm and 7µm polydimethylsiloxane coating For manual sampling For Varian 8100/8200 AutoSampler	57306 57307

Description	Cat. No.
SPME Inserts and Inlet Liners	
Inserts, Varian SPI Models 1093-94SP1, Series 3000 GC each	26364,01
pk. of 5	26364,05
pk. of 25	26364,25
Inlet Liners, Splitless, 0.75mm ID# For Hewlett-Packard GC - 5700, 5800, 5890 each	26375,01
pk. of 5	26375,05
pk. of 25	26375,25
For Varian GCs (all) each	26358,01
pk. of 5	26358,05
pk. of 25	26358,25

Vials, Hole Caps, Teflon®/Silica Septa

Screw Top Vials for Varian 8100/8200 AutoSampler Clear, 2mL, pk. of 100	27124-U
Amber, 2mL, pk. of 100	27005
Headspace Vials Clear, 4mL, pk. of 10	26901
pk. of 100	27136
Amber, 4mL, pk. of 10	26930
pk. of 100	27006

Thermogreen™ LB-2 Septa, Pre-Drilled*

11mm, pk. of 25	23167
11mm, pk. of 50	23168
9.5mm, pk. of 25	23161
9.5mm, pk. of 50	23162-U

*First time users must order both holder and fiber assembly. Holder is reusable indefinitely.

*You can reduce inlet volume by replacing a standard 2mm ID liner with this specially designed liner. This increases sensitivity and provides sharper peaks.

* Pre-drilled septa reduce septum coring that can cause extraneous peaks.

For additional fiber assemblies and kits, and for SPME accessories, please see our current catalog.

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Teflon – E.I. du Pont de Nemours & Co., Inc.
Tenax – Enka Research Institute Arnhem

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